EP66-82

Chinese Communist Industrial Production

by

[redacted] STATINTL

October 21, 1966

CONTENTS

Page

Tables

Charts

Chinese Communist Industrial Production

I. Introduction

Taking to heart Lenin's admonition that only through industrialization could China become a socialist state, the Chinese Communists made the development of heavy industry the core of their First Five Year Plan (1953-1957). The rapid growth of heavy industry was to provide the material base for national defense, for the well-being of the people, and for still further increases in industrial capacity. The goal of industrialization soon became identified with overtaking Great Britain in the absolute level of industrial production. In 1958, with the optimism of the "leap forward," the Chinese expected to achieve their goal in 15 years. More recently they have said that it may take from 30 to 50 years, but the goal is the same:

> To convert China, step by step, from a backward, agricultural country into an advanced, socialist, industrial state. 1/

This paper will present an independently constructed index of total industrial production in Communist China for 1949-1965. Although data on the output of specific military items were not available, these items had to be included in the index by imputation, because the weights could not be adjusted satisfactorily to exclude military production. Because most military production is concentrated in the metal processing industry, the assumption implicit in the construction of the index is that the military component of the metal processing industry grew at the same rate as the civilian component. However, if the weight for the metal processing industry

could have been adjusted, the rate of growth shown by the resulting index of civilian industrial production would have been lower than that of the index presented in this paper. On the other hand, if military production could have been included explicitly, the indexes for the metal processing industry and for total industrial production both would have been raised.

For the years 1949 to 1959, the index was calculated by weighting data on the physical output of final products in three stages. In the first stage, the physical output series were grouped by branch of industry and weighted by their respective prices. In the second stage, to form an index for industry as a whole, the resulting indexes for individual branches of industry were weighted by estimates of the values added that were computed from the relative shares of the wage bill paid to industrial workers. In the third stage, an index for total industrial production was calculated from the index for industry and a separately calculated index for handicrafts. Because data on the earnings of handicraft workers were not available, an estimate of the values added by industry and handicrafts was derived from Chinese Communist data for the net value of total industrial production.

For the years 1960 to 1965, because handicraft production could not be separated from the production of industrial enterprises and because the number of physical output series was greatly reduced, separate indexes could not be calculated for individual branches of industry or for industry and handicrafts. An index for total industrial production was calculated by weighting the series for which estimates of physical

output were available by their respective prices and adjusting the resulting index for the difference between its rate of growth and that shown by the index of total industrial production for the years 1953-1957.

The index is more reliable for the years 1949-1957 than it is for the years 1958-1965. Through 1957, the data on which the index is based are reasonably accurate and their coverage is sufficiently broad for the index to be used with confidence. For the years 1958-1959, although allowances were made for the deterioration in the quality of the items produced and for the tendency of official sources to exaggerate achievements in production, there may still be a small upward bias in the index. For the years since 1960, however, the index should be regarded as providing only a general indication of the trend in industrial production, because the estimates of physical output are subject to a wider range of error and because the size of the sample is greatly reduced.

My index of industrial production for Communist China is less reliable than indexes for Western European countries and is also less reliable than indexes constructed by Western scholars for other communist countries. Because of the large body of data made available by highly developed statistical reporting systems, and because of the detailed analytical work that has been done, the indexes for these countries reflect accurately the growth of industrial production. My index for Communist China may not even be as reliable as the indexes for many of the less developed countries. Because

of problems in statistical reporting in the less developed countries, individual output series may be no more accurate than those for China, but more complete coverage means that the indexes probably reflect the growth of industrial production more accurately than my index reflects the growth in China.

The growth of industrial production in Communist China, as measured by the index described above, is discussed in Section II. As an aid to the evaluation of the index, comparisons are made with the growth of industrial production in other countries in Section III and with two other independently constructed indexes of Chinese industrial production in Section IV. Finally, the prospects for the growth of industrial production during the Third Five Year Plan (1966-1970) are discussed in Section V. The index is described in detail in Appendix A, the principal sources of data on the production of industrial commodities are discussed in Appendix B, and alternative estimates of physical output for those commodities used in the construction of the index for the years 1960 to 1965 are presented in Appendix C.

II. Summary of the Growth of Industrial Production

Industrial production in Communist China, as measured by the index presented in this paper, grew rapidly during the years 1949-1965, at an average annual rate of 11 percent, but the differences from year to year and by branch of industry were extreme. My index and the official Chinese Communist index for total industrial production, industry, and handicrafts are shown in Table 1. The average annual rates of growth for individual branches of industry for the years 1950-1952, 1953-1957, and 1958-1959 are presented in Table 2; and the structure of industrial production in 1949, 1952, 1957, and 1959 is presented in Table 3. It was not possible to calculate the rates of growth by branch of industry or the structure of industrial production for the years since 1959 because of the lack of data.

A. Economic Rehabilitation, 1949-1952

During the period of economic rehabilitation (1949-1952), my index shows that industrial production more than doubled, growing at an average annual rate of 27 percent. This rapid rate of growth was characterized by large increases in employment, but little or no growth in the net value of fixed capital assets. The capacity damaged by the war or lost through the Soviet removal of equipment from Manchuria in 1945 was repaired or replaced and put back into operation, and supplies of raw materials were improved. Industry grew at an average annual rate of 35 percent and handicrafts at 8 percent.

Table 1

Indexes of Industrial Production in Communist China
1949-1965

1956=100

	Field			Official a/		
	Total	Industry	Handicrafts	Total	Industry	Handicrafts
1949	27.2	21.8	56.9	19.9	18.4	27.7
1950	34.3	29.0	64.2	27.2	24.0	43.2
1951	45.6	41.2	70.2	37.5	34.5	52.5
1952	56.1	53.1	72.3	48.8	46.1	62.5
1953	70.2	65.2	97.9	63.5	60.6	77.9
1954	80.2	76.0	103.7	73.9	70.8	89.4
1955	80.7	78.8	91.2	78.0	76.3	86.5
1956	100.0	100.0	100.0	100.0	100.0	100.0
1957	109.4	111.0	100.2	111.4	110.8	114.3
1958	143.8	149.8	110.2	185.2	--	--
1959	181.6	192.4	121.3	257.9 b/	--	--
1960	188.5	--	--	332.3 c/	--	--
1961	124.5	--	--	--	--	--
1962	109.6	--	--	--	--	--
1963	120.7	--	--	184.0 d/	198.7 e/	110.7 f/
1964	134.9	--	--	211.6 g/	--	--
1965	147.6	--	--	234.9 h/	--	--

a. State Statistical Bureau, Ten Great Years, Peiping, 1960, pp. 87 and 94, except as noted.

b. Press Communique on the Growth of China's National Economy in 1959, Peiping, 1960, p. 1.

c. Planned. Li Fu-ch'un, "Report on the Draft Plan for 1959," Jen-min jih-pao (People's Daily), March 31, 1960.

d. Derived from the statement that the gross value of handicraft output was about 10 percent of the gross value of total industrial production. See "Consolidate and Enhance Handicraft Cooperatives in Order to Actively Develop Handicraft Production," editorial, Jen-min jih-pao (People's Daily), October 27, 1963. For the gross value of handicraft output, see f, below.

e. Derived from the gross value of industrial output, which is the difference between the gross value of total industrial production and the gross value of handicraft output.

f. Derived from the statement that the gross value of handicraft output was more than 4 times that of 1949. See T'ien P'ing, "Great Changes in the Handicraft Industry in the Past Fifteen Years," Ta-kung pao (Impartial Daily), October 9, 1964. For the gross value of handicraft output in 1949, see a, above.

g. Derived from the 15 percent increase reported in Chou En-lai's speech to the 1st Session of the 3rd National People's Congress on December 21-22, 1964. See American Consulate General, Hong Kong, Survey of China Mainland Press, No. 3370, January 5, 1965.

h. Planned. Derived from the planned increase of 11 percent. See Ibid.

Table 2

Average Annual Rates of Growth of Industrial Production, by Branch
1950-1952, 1953-1957, and 1958-1959

	1950-1952	1953-1957	1958-1959
Total industrial production	27	14	29
Industry	35	16	32
Electric power	19	22	46
Coal	27	14	41
Petroleum	53	27	59
Ferrous metals	110	31	41
Metal processing	43	19	39
Chemical processing	60	26	40
Building materials	63	19	34
Timber	28	20	22
Paper	51	20	33
Textiles	36	9	26
Food	22	12	15
Handicrafts	8	7	10

Table 3

Structure of Industrial Production in Communist China a/
1949, 1952, 1957, and 1959

Percent of value-added

	1949	1952	1957	1959
Total industrial production	100	100	100	100
Industry	68	80	86	90
Electric power	2	1	2	3
Coal	11	11	11	13
Petroleum	Negl.	1	1	1
Ferrous metals	1	3	6	7
Metal processing	9	13	16	19
Chemical processing	1	2	3	3
Building materials	3	7	8	9
Timber	5	5	6	5
Paper	1	1	1	1
Textiles	16	20	15	15
Food	20	17	16	13
Handicrafts	32	20	14	10

a. Because of rounding, components may not add to the totals shown.

Within industry, the rates of growth ranged from 19 percent in the electric power industry to 110 percent in the ferrous metals industry. The branches of industry producing industrial materials, such as ferrous metals, chemical processing, and building materials, had the highest rates of growth. These branches were followed by the metal processing industry and then less closely by the fuels and the light industries. Although the growth of the fuels and light industries was relatively slow, the rates achieved were quite high.

There are no reliable indexes of industrial production by branch of industry for the pre-Communist period with which my indexes for the period of economic recovery can be linked, but the production of key industrial commodities may be used as a rough measure. A comparison of the rates of growth shown by individual branches of industry for the years 1950-1952 and the percentage decline in the production of key commodities from their peak to the level of output achieved in 1949 shows an inverse relationship. It is clear, therefore, that the rapid growth of total industrial production in this period represents a return to previously achieved levels of output rather than a growth in the productive capacity of industry and that the differences in the rates of growth shown by individual branches of industry are closely related to the extent to which production had fallen from the pre-Communist peak levels.

B. The First Five Year Plan, 1953-1957

During the First Five Year Plan (1953-1957), industrial production is estimated to have doubled again, reaching a level more than four times that of 1949, but the

rate of growth was slower and less steady than it had been during the period of economic rehabilitation. Although averaging 14 percent, the annual increases ranged from less than 1 percent in 1955 to 25 percent in 1953.

The large increase in output in 1953 resulted from a 9 percent increase in the net value of fixed capital assets and an increase of 16 percent in the average number of workers. The relatively slow growth in capital assets and the rapid growth in employment, however, are more typical of the period of economic rehabilitation that they are of the rest of the First Five Year Plan, when capital assets increased at a rate in excess of 20 percent annually, but employment increased at only 7 percent. These data, together with fragmentary data on the continued increase in the intensity with which existing capacity was used, indicate that the large increase in output achieved in 1953 was a continuation of the rapid growth achieved during the period of economic rehabilitation and tend to suggest that the pre-Communist peak level of production was not reached until 1953. Because 1953 was really part of the period of economic rehabilitation, the average annual rate of growth of 12 percent achieved during the years 1954-1957 is a better measure of industrial growth in China than the rate for the First Five Year Plan as a whole.

During the five year period, industry grew at an average annual rate of 16 percent and handicrafts at a rate of 7 percent. Within industry, the rates of growth

for individual branches were lower and the range in the rates was narrower than it had been during the period of rehabilitation, varying from 9 percent in the textile industry to 31 percent in the ferrous metals industry. The general pattern of the rates of growth shown during the First Five Year Plan was much the same as it had been during the period of recovery, the most marked change being the relative improvement in the rates of growth shown by the fuels industries.

Different factors determined the general pattern of growth in the two periods. Whereas the relative rates of growth during the period of rehabilitation had been determined largely by the extent to which the disruption of production has been repaired, the pattern of growth during the First Five Year Plan was the result of investment policy decisions made by the Chinese Communist regime. Since the regime decided to adopt the Soviet model of industrialization and concentrated investment in heavy industry, heavy industry quite naturally grew more rapidly than light.

C. The Leap Forward, 1958-1960

During the "leap forward" (1958-1960), the average annual rate of growth in industrial production surged to 20 percent. This growth was accompanied by a massive increase in industrial employment and by mass emulation campaigns requiring an intensity of work that could not be maintained. The rate of growth dropped from 31 percent in 1958 to 26 percent in 1959 and only 4 percent in 1960.

Most of the growth in industrial production during the years 1958-1960 would have occurred, even without a "leap forward." The acceleration of the existing industrial construction program during 1958 and 1959 resulted in large additions to capacity and a rapid growth in the net value of fixed capital assets. For example, of the 921 major industrial construction projects started during the First Five Year Plan, 428 were completed and in normal operation by the end of 1957, and 109 went into partial operation. 2/ But in 1958 alone, a large number of new construction projects were started and 500 were completed. 3/ Merely putting these new plants into operation would have been enough to guarantee China substantial gains in industrial production. The true accomplishments in industry during these three years, therefore, were achieved in spite of the excesses of the "leap forward".

In 1958-1959, industry grew at an average annual rate of 32 percent and handicrafts at 10 percent. Within industry, the rates of growth were nearly as high as those achieved during the period of economic rehabilitation, but the range was not as wide. The highest rate of growth was shown by the petroleum industry, which grew at 59 percent, and the lowest was shown by the food industry, which grew at 15 percent. The most striking change in the pattern of rates of growth shown by the individual branches of industry was the rise in the position of the fuels industries. Ranking the branches of industry by the rates of growth shown during the period of rehabilitation, the First Five Year Plan, and the "leap forward," it can been seen that the petroleum industry rose from fourth place in 1950-1952 to become the fastest growing branch of

industry during the "leap forward". The electric power industry rose from eleventh place to second, and the coal industry rose from ninth to third. Thus, the fuels industries became the three fastest growing branches of industry.

D. Recovery and Readjustment, 1961-1965

Total industrial production fell sharply in 1961 and continued to fall, although less sharply, in 1962. Production in 1962 was slightly above [redacted] the level of 1957 but [redacted] only about 60 percent of the peak reached in 1960. After the withdrawal of the Soviet technicians in mid-1960, the Chinese found they could not operate many of the key industrial plants that had been built as Soviet aid projects and were forced to close them down. In light industry, the levels of output achieved during the "leap forward" could not be maintained because of the failure of agriculture to supply needed raw materials. Even without these blows to the economy, however, the dislocation of industry, the exhaustion of the labor force, and the crisis in the food supply would probably have been severe enough to cause the collapse of the "leap forward".

With the adoption of more pragmatic policies in 1962, industry began to recover. In each year since 1962, total industrial production has increased by about 10 percent, reaching in 1965 a level slightly higher than that of 1958. This growth, however, has been achieved by the gradual re-employment of capacity that had been installed during or prior to the "leap forward" rather than by the addition of new productive capacity. Because almost all idle capacity has now been put back into production, and because few capital construction projects have been undertaken since 1960, further increases in output will be more difficult to achieve than those of the 3 years, 1963-1965.

The number of output series available for the years since 1960 is not large enough to permit estimates for individual branches of industry, but the series do indicate the general pattern of growth. The output of primary energy is now about the level of 1958, but it is still far below the peak level of 1960. The relative importance of the various sources of energy has changed. Although coal still provides the bulk of the primary energy, it has declined in relative importance. In 1957 coal supplied 95 percent of all primary energy, but in 1965, it supplied only 91 percent. Petroleum has risen from 2 percent in 1957 to 6 percent in 1965, and water power has remained at about 3 percent.

By far the most spectacular performance in the field of industrial materials has been shown by the chemical processing industry. The output of chemical fertilizer in 1965 was more than five times that of 1957 and nearly double the previous peak level of 1960, and the Chinese claim that by 1963 the chemical processing industry had become the fourth largest branch, having risen from seventh place in 1952. 4/ The output of most industrial materials, however, is not yet back to the peak levels of 1959 or 1960. The output of crude steel in 1965 was about equal to the volume of usable steel produced in 1959, and the output of cement and timber were at about the levels of 1958.

There are not sufficient data to make a precise estimate for the metal processing industry. Output is certainly well above the level of 1957, but has probably not yet reached the level of 1958. Output may be on the order of 30 to 40 percent.

greater than that of 1957. On balance, the output of heavy industry as a whole in 1965 had not yet reached the level of 1959, although it probably exceeded the level of 1958.

The level of output in light industry has recovered more slowly than heavy industry, because of the failure of agriculture to provide an adequate supply of raw materials. The output of paper in 1965 was about 25 percent above the level of 1957 but still nearly 10 percent below that of 1958. The output of cotton cloth was less than 80 percent of the output achieved in 1957. Although the output of woolen and silk cloth has recovered more rapidly than that of cotton cloth and may be approaching peak levels, the textile industry as a whole is probably still below the level of 1957, because of the importance of cotton cloth. The food industry has recovered more rapidly than the textile industry. The output of sugar has already exceeded the previous peak level achieved in 1959. Sugar, however, is not typical of the food industry as a whole. The aggregate output of the food industry is certainly above the level of 1957 but has probably not yet reached the level of 1958. On balance, the output of light industry as a whole in 1965 was probably only slightly higher than the level of 1957.

III. A Comparison with Industrial Production in Other Countries

To place the Chinese accomplishment in perspective, the average annual rates of growth of industrial production in Communist China are compared with those of the Soviet Union, Japan, and India in Table 4. The rate of growth achieved by Japan over the last 16 years (to 1965) is considerably higher than the rates of growth shown by the other three countries. Surprisingly, Communist China had the second highest rate of growth, exceeding slightly that shown by the Soviet Union. By far the lowest rate of growth of these four countries is that shown by India.

The rates of growth for the postwar period, however, are not satisfactory indicators of the relative performance of industry in these four countries, in part because of differences in the extent to which they had recovered from wartime damage. In 1949, for example, the level of production in Communist China was probably lower than it had been at any time since the early 1930's, whereas the Soviet Union had already regained its previous peak level of output. It is clear, therefore, that the average annual rate of growth shown by Chinese industry only exceeded that of the Soviet Union because of the very large increases in output achieved during the period of economic rehabilitation.

For this reason, the rates of growth for prewar to 1965 are also shown in Table 4. Over this longer period, the rates of growth are slower, their range is narrower, and their ranking is changed. The Soviet Union shows that highest rate of growth, followed closely by Japan, with China and India trailing. The two latter countries show almost the same rate of growth.

Table 4

Average Annual Rates of Growth of Industrial Production
for Selected Countries a/

	Soviet Union	Japan	Communist China	India
1949 to 1965	9.6	14.9	11.2	6.5
Prewar to 1965	6.4 b/	5.6 b/	4.4 c/	4.2 b/
Year in which previous peak was regained to 1965	9.6 d/	13.8 e/	6.4 f/	6.7 g/

a. Calculated from the data in Table 10.

b. Initial year 1937.

c. Initial year 1933.

d. Initial year 1949.

e. Initial year 1955.

f. Initial year 1953.

g. Initial year 1951.

The changes in the rates of growth that result from the inclusion of the prewar period are strongly affected by the wartime experience. Industrial production in the Soviet Union, which reached its peak level in 1940 or 1941, had fallen to about one half of its peak level by 1945. Industrial recovery, however, was rapid and output had regained its peak by 1949. In Communist China, the peak level was probably not reached until 1943 or 1944, a time when the Japanese controlled most of the important industrial facilities. Production collapsed in 1945 and continued to decline during the period of the civil war, probably falling to 40 percent of its peak in 1949. After the restoration of peace and order in 1949, industrial production recovered very rapidly indeed, regaining its peak level by 1953.

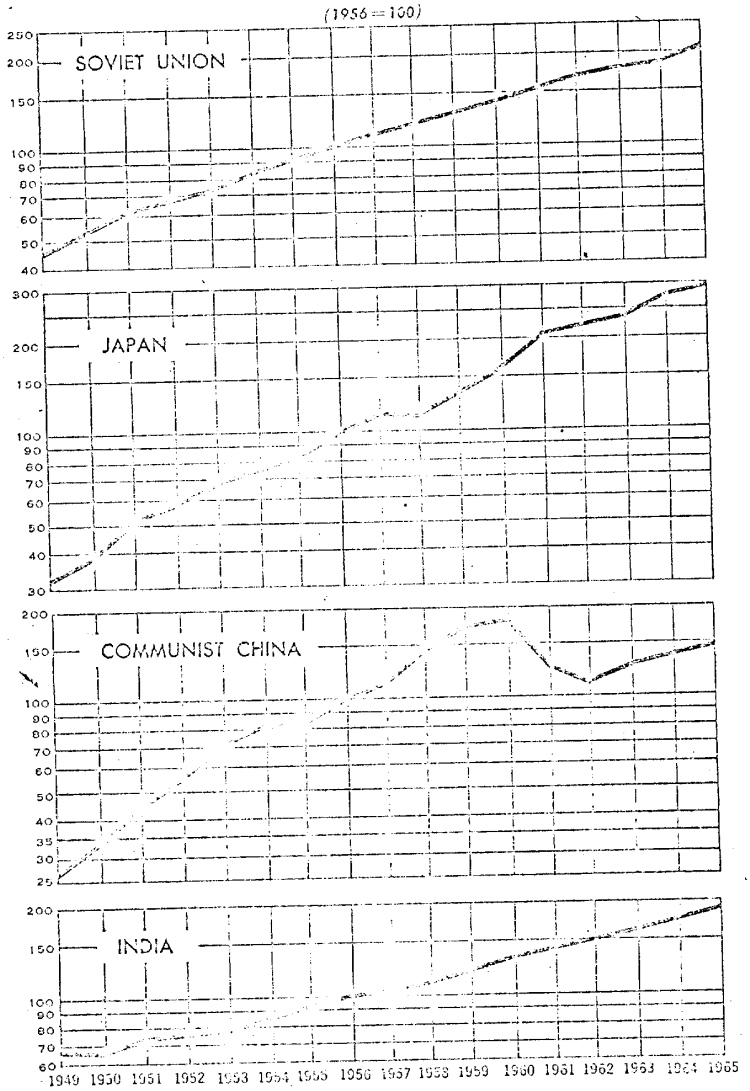
The Japanese experience was even more extreme than that of China. Japan reached a peak in 1941 and remained at about that level through 1944. Because of the damage and severe curtailment of imports of raw materials sustained during the last two years of the war, production in 1946 plummeted to only one fifth of its peak level. Not only was the decline greater than that in the Soviet Union or China, but the rate of growth during the period of recovery was slower and more erratic. Japan did not regain her peak level of production until 1955. The pattern of change in India is in marked contrast to that of the other three countries. Industrial production in India remained virtually unchanged between 1940 and 1950. There was a slight decline in output in 1946 and 1947, but output in 1947 was only 12 percent below the peak level of 1945.

In an attempt to allow for the differing impact of the war on the growth of industrial production in these countries, the average annual rates of growth have also been calculated for the period covering the year in which the previous peak level was regained through 1965. These rates of growth are more typical of the recent growth of industrial production than those for prewar to 1965 or for 1949-1965. The rates of growth are as high as those for 1949-1965 and the range is as wide, but the upward bias due to the inclusion of the large increases in Chinese industrial production during the period of economic rehabilitation is removed.

Because a comparison of the pattern of change in the rates of growth from year to year is also of interest, the indexes of industrial production are plotted in Chart 1. The chart shows that the growth of industrial production in Japan and India has been sustained and quite steady. The growth of industrial production in the Soviet Union has also been sustained, but the rate of growth has been declining. The growth of industrial production in Communist China, however, has been very erratic.

Chart 1

The Growth of Industrial Production in Selected Countries
1949-1965



IV. A Comparison with Other Indexes of Chinese Industrial Production

The growth of industrial production in Communist China has been measured in two other studies. One of these was prepared by Chao Kang. 5/ Chao constructed an index for the years 1949-1959 using the same type of weighting system that is used in the index presented in this paper. The other study is part of a larger work by Liu Ta-chung and Yeh Kung-chia, who made estimates of value-added for the years 1933 and 1952-1959. 6/ The rates of growth for total industrial production during the First Five Year Plan (1953-1957) as measured by the indexes presented in these two studies are very similar to that shown by my index. A detailed comparison of the indexes, however, shows that the similarity in the rates of growth is due to compensating differences in concept, in coverage, and in estimates of physical output.

One of the differences between my index and the Chao index is in coverage. Chao's index includes two branches of industry not included in my index: the nonferrous metals and the "daily-use commodities" 7/ industries. Another difference in coverage is that my index includes the entire metal processing industry, but Chao's includes only machine building, one of the three subbranches of the metal processing industry.

A second difference is in concept. Chao uses the largest possible sample to measure the rate of growth, whereas I exclude series for intermediate products consumed largely within the branch of industry in order to make the individual branch indexes approximate value-added as closely as possible. In the ferrous metals industry, for example, I used only the output series for rolled steel, although data were available for the production of iron and manganese ore, pig iron, and crude steel.

Another difference is in estimates of physical output. Chao's index for the timber industry, for example, is derived from his estimates of the amount of timber cut, but his estimates understate the rate of growth in output because his figure for 1952 includes the timber cut by all timber enterprises, 8/ whereas his figures for 1955 and 1956 include only the timber cut by state-operated enterprises. 9/ The figure for 1957 also understates the output, but for a different reason. It is a planned figure rather than the level of output actually achieved. 10/

The principal difference between my index and the Liu-Yeh index is in coverage. The coverage of total industrial production in both indexes is the same as the coverage of industry and handicrafts as defined by the State Statistical Bureau. The State Statistical Bureau divides this universe into the following categories:

Industry
  Modern Industry
  Factory Handicrafts
Handicrafts

Following the practice of the State Statistical Bureau, I have divided total industrial production into industry and handicrafts, but Liu and Yeh have not. Instead, they have divided total industrial production into the categories of factories, handicrafts, mining, and utilities. If a small amount of handicraft mining is ignored, factories, mining, and utilities correspond closely to the official category of modern industry; and handicrafts (as defined by Liu and Yeh) corresponds to the official categories of factory handicrafts and handicrafts.

Another important difference is in the method of estimation. I based my index on a sample of commodities that I consider to be typical of the commodities produced by the various branches of industry. But Liu and Yeh were forced to make estimates for the entire output of industry, because they wanted to measure the level as well as the trend. They made direct estimates for those commodities that they could identify but had to make indirect estimates for the rest. Although the actual computation was a complicated process, conceptually the method used to estimate value-added involved only four steps. The first was to adjust the official data on the gross value of industrial output from the official classification system to the system selected by the authors. The second step was to identify as much of the physical content of each category as possible. For this purpose, a commodity was considered to be identified if both price and physical output were known or could be estimated. The third step was to divide the gross value of output for each category derived in step one into "identified" and "unidentified" portions. The gross value of the identified commodities was the sum of price times quantity, and the gross value of the unidentified commodities was the residual.

The fourth step was to estimate value-added. The value-added by the identified commodities was estimated directly. Because no data on value-added were available for 1952 or for any other year since 1949, data from two Japanese studies of industry in Northeast China in 1939 and 1943, respectively, were used. The value-added by the

unidentified commodities, however, had to be estimated indirectly. These commodities were considered to be those successfully identified in 1933 but not identified for 1952 or later years. The estimates of value-added for the unidentified commodities were made by applying the average ratio of value-added to gross value for all unidentified commodities in 1933 to the gross value of the unidentified commodities derived in step three on the assumption that this ratio had not changed. This procedure means, in effect, that real value is attributed to the double counting which results from methodological deficiencies in the compilation of official data on the gross value of industrial output.

My index for the year 1957 is compared with the Chao and the Liu-Yeh indexes in Table 5. There is substantial agreement between the three indexes for the growth of total industrial production, but the similarities in the aggregates conceal differences in detail. The rate of growth shown by my index for industry is considerably higher than that shown by the Chao index and substantially lower than that shown by the Liu-Yeh index. For handicrafts, the divergence is even wider, but the ranking of the indexes is reversed: my index grows more slowly than the Chao index but faster than the Liu-Yeh index.

Within industry, the branch showing the greatest divergence is the machine-building industry. The rate of growth shown by the Liu-Yeh index for the machine-building

industry is extremely high because it is based on the officially reported gross value data rather than on an independent calculation. The full extent of the difference between my index and the Chao index for machine building is not shown by the index numbers for 1957. In 1956, however, the Chao index is 351.3 whereas my index is only 282.0. The high rate of growth shown by the Chao index for the year 1956 appears to be the result of overweighting merchant vessels and including a number of very rapidly growing but relatively unimportant manufactured consumers goods.

For the years 1958-1959, the divergence between the three indexes for total industrial production, for industry, and for handicrafts is greater than in the earlier years. A detailed comparison of the indexes cannot be made easily, however, because Chao does not present indexes by branch of industry and because Liu and Yeh leave gaps in their estimates. Liu and Yeh, for example, do not present data on the machine-building industry for these years. If 1957 is taken as 100, the three indexes for 1959 are:

	Field	Chao	Liu-Yeh
Total industrial production	166.1	174.3	147.1
Industry	173.3	189.6	156.8
Handicrafts	121.1	100.0	111.5

Table 5

A Comparison of Three Indexes of Chinese Industrial Production for 1957 25X1

1952=100

	[redacted]	Chao a/	Liu-Yeh b/
Total industrial production	195.1	189.8	194.2
Industry	208.8	195.9	240.2
Electric power	266.4	266.4	265.9
Coal	195.6	197.7	194.0
Petroleum	334.4	334.4	334.4
Ferrous metals	386.5	353.7	354.0
Nonferrous metals	--	370.0	--
Metal processing	241.0	--	--
Machine building	284.1	271.5	441.1
Chemical processing	312.9	314.2	277.3
Building materials	239.8	241.6	269.3
Timber	252.9	199.6	--
Paper	245.6	220.1	253.9
Textiles	153.2	136.7	138.6
Food	180.2	156.2	168.7
Handicrafts	138.7	164.8	114.0

a. Chao Kang, The Rate and Pattern of Industrial Growth in Communist China, Ann Arbor, 1965, pp. 88 and 96.

b. Liu Ta-chung and Yeh Kung-chia, The Economy of the Chinese Mainland: National Income and Economic Development, 1933-1959, Princeton, 1965, pp. 66, 146, 573, and 585. The index of total industrial production is derived from data on the value-added (in 1952 yuan) by industry and handicrafts, and the value-added by industry is derived from data on factories, mining, and utilities. The indexes for electric power, coal, and petroleum are derived from the data on net value-added in Ibid., pp. 573 and 585. The indexes for all other branches of industry are derived from the data on gross value-added in Ibid., p. 146. Ferrous metals is the sum of pig iron, steel, and rolled steel; building materials is the sum of cement, sheet glass, and other construction materials; textiles is the sum of cotton yarn, cotton cloth, silk, silk piece goods, woolen textiles, grass cloth, and knitted goods; and food is the sum of sugar, milled rice, wheat flour, edible vegetable oils, and cigarettes.

V. The Prospects for Industry During the Third Five Year Plan, 1966-1970

The prospects for industry in Communist China during the Third Five Year Plan (1966-1970) are a matter of great concern, not only in China, but throughout the Western world. The current political turmoil in China, however, makes any attempt to forecast the growth of industrial production over the next five years unusually hazardous.

The current cultural revolution was not originally planned for economic reasons. Important documents such as the Decision of the Central Committee of the Chinese Communist Party on the Great Proletarian Cultural Revolution [11] or the Communiqué of the eleventh Plenary Session of the Central Committee [12] (held on 1-12 August 1966) make only passing references to economic matters. But there are already rumors to the effect that production has declined, at least in some enterprises, because of the time and energy required of managers and workers alike for demonstrations, parades, and endless meetings to discuss the thought of Mao Tse-tung. [13]

Since early September 1966, the regime has been concerned with the impact of the cultural revolution on production. The front-page editorial in Jen-min jih-pao on September 7th stated that production must not be interrupted. Workers were instructed to stay at their jobs, and the Red Guards were cautioned not to interfere. The frequency with which these themes have been repeated by national and provincial news media indicates that the concern is genuine. Production has been affected already,

but it is not yet clear whether the cultural revolution will spill over directly into the field of economics. Statements such as the following have appeared frequently in the Chinese press:

> The unprecedented scale of the present great cultural revolution necessarily presages a flying leap in the development of our Socialist revolution and a new great leap forward in Socialist construction. 14/

The tone of these statements has lead to the speculation that the Third Five Year Plan may be superseded just as the Second Five Year Plan was superseded by the "leap forward."

If a new leap were in the making, one would expect to see drastic increases in targets and production claims, and in fact, recent claims are strongly reminiscent of those made in 1958 and 1959. For example, the claims that industrial production in the first eight months of 1966 increased by 20 percent over the corresponding period of last year and that the increase in the output of various industrial commodities ranged from 40 percent to 200 percent 15/ appear to be unreasonably high. But there is, as yet, no evidence that targets have been raised.

On balance, it does not now appear likely that the Chinese Communists will attempt a new leap, but given the current political instability, it is not impossible. If they did, however, it would be doomed to failure. Industrial production might spurt ahead briefly, but any new leap would undoubtedly collapse. The collapse would be worse than that of 1961-1962 because the Chinese do not have the cushion now that they had in 1958 and the population has increased by some 100 million persons.

Industrial production has increased at about 10 percent annually during the last three years and has regained the level achieved in 1958, but even without a new "leap forward" or the disruptions of the cultural revolution, the Chinese would not be able to maintain such a high rate of growth. The increases in production during this period of readjustment have been based on the re-employment of existing capacity. Very little new capacity has been installed since the collapse of the "leap forward" in 1960, and the margin for investment is small.

The chief determinants of the growth in industrial production over the next few years will be the manner in which the limited resources available for investment and defense are allocated and the performance of agriculture. If the limited resources available, the scarce materials and skilled manpower, continue to be concentrated in the weapons program, the output of heavy industry will expand only slowly.

Most of the capacity not now in production is concentrated in light industry, especially in textiles, but the failure of agricultural production to keep up with the increase in population means that agriculture will not be able to supply the raw materials necessary for light industry. The output of industrial crops will continue to be sacrificed in favor of food crops. Continued weak performance of agriculture will mean that light industry will not grow rapidly and that the output of many light industrial products probably will not reach their previous peak levels during the Third Five Year Plan.

In summary, the drain of the weapons program of heavy industry and the dependence of light industry on agricultural raw materials would seem to preclude a rapid rate of growth during the Third Five Year Plan. Simply to regain the level of production achieved in 1960 by the end of the Third Five Year Plan, industrial production will have to grow at a rate in excess of 5 percent annually. If the Chinese do not attempt a new leap, they probably can maintain a rate of growth of 5 percent and may well regain the previous peak level of industrial production by 1970, but the misguided economic policies of the "leap forward" will have cost China a full decade's industrial growth.

APPENDICES

Appendix A

Description of the Index

The index of industrial production in Communist China presented in this paper was calculated primarily from data on the physical output of final products, although some intermediate products were included where data on final products were not available. These physical output series were weighted in three stages to form the indexes for the individual branches of industry, the indexes for industry and handicrafts, and the index for total industrial production.

I. The Physical Output Data

Both the coverage and the accuracy of the physical output data are more adequate for the period of economic recovery (1949-1952) and the First Five Year Plan (1953-1957) than for the "leap forward" (1958-1960) or for the recent period of readjustment (1961-1965). The index for the earlier years was based on a sample of 33 commodities produced by industrial enterprises and 8 commodities produced by handicrafts. These data were drawn primarily from official sources. It is believed that these data are reasonably accurate and that their coverage is sufficiently broad for index to be used with confidence.

For the years 1958-1959, estimates were available for 25 commodities produced by industrial enterprises and 6 commodities produced by handicrafts. Because of the deterioration in the quality of the items produced and the tendency of official sources

to exaggerate achievements in production during the "leap forward", published data were not accepted until they had been checked against other available information and adjusted as necessary. Specifically, "backyard" production of steel was not included in the physical output data, and the claims for production of coal were reduced to take account of exaggeration in the official data and the low calorific value of the coal. Although allowances were made, there may still be a small upward bias in the index for this period.

For the years 1960-1965 estimates were available for only 10 commodities,[16] and it was not possible to separate the production of industrial enterprises from that of handicrafts. Because these estimates are subject to a wider range of error than the data for earlier years and because the size of the sample is greatly reduced, the index for these years is less reliable than it is for the years before 1960. It should be regarded as providing only a general indication of the trend in production.

II. The Construction of the Index

A. For the Years 1949-1959

Indexes showing the growth of production for individual branches of industry, for industry and handicrafts, and for total industrial production during the years 1949-1959 are presented in Table 6. The construction of these indexes is described below:

Table 6

Derivation of the Index of Industrial Production in Communist China
1949-59

1956=

	1956 Weights		1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
otal industrial production		100.00	27.17	34.35	45.62	56.06	70.15	80.18	80.69	100.00	109.36	143.78	181.60
Industry	100.00	84.79	21.84	29.00	41.22	53.13	65.18	75.96	78.81	100.00	111.00	149.81	192.41
Electric power	2.18		25.96	27.42	34.65	43.76	55.41	66.30	73.80	100.00	116.56	165.91	250.12
Coal	12.26		29.25	38.71	47.87	59.98	62.85	75.46	88.37	100.00	117.29	179.85	234.51
Petroleum	0.92		10.40	17.20	26.23	37.49	53.48	67.84	83.06	100.00	125.37	194.67	318.14
Ferrous metals	5.96		3.73	12.24	21.28	34.48	46.24	54.93	69.07	100.00	133.28	189.44	264.06
Metal processing	19.96		14.83	21.76	35.28	43.80	51.14	60.88	62.64	100.00	105.53	163.72	204.21
Chemical processing	2.88		9.38	16.27	28.94	38.14	47.53	63.11	75.96	100.00	119.33	166.33	234.58
Building materials	9.82		10.34	22.06	38.95	44.75	60.64	71.95	70.44	100.00	107.30	145.47	191.93
Timber	5.83		25.09	29.75	35.20	53.04	83.32	105.88	100.11	100.00	134.14	168.98	199.63
Paper	1.21		14.82	19.29	33.03	50.98	58.56	71.07	78.79	100.00	125.19	166.87	233.10
Textiles	21.10		24.60	34.37	45.33	61.36	74.88	85.27	77.85	100.00	94.00	116.92	148.69
Food	17.88		35.17	36.75	52.39	64.48	78.98	85.62	93.17	100.00	116.17	127.32	152.96
Handicrafts		15.21	56.87	64.16	70.16	72.25	97.87	103.72	91.22	100.00	100.21	110.18	121.34

1. Industry

The index of production for industry was constructed from Chinese data on the physical output of 33 commodities produced by 11 branches of industry. These data were weighted in two stages. In the first stage the output series were grouped by branch of industry and indexes were calculated for each branch separately. The indexes for seven branches of industry -- electric power, coal, petroleum, ferrous metals, building materials, timber, and paper -- are each based on a single commodity. For the electric power, coal, timber and paper industries, production is relatively homogeneous, and a single output series includes the entire production of the branch. For the ferrous metals industry, only the output series for the production of rolled steel was used. Although data were available for the production of iron and manganese ore, pig iron, and crude steel, these commodities were not included, because they are intermediate products which are almost entirely consumed within the industry. For the petroleum and the building materials industries, the only commodities for which data were available are crude oil and cement, respectively. The indexes for the remaining branches of industry -- metal processing, chemical processing, textiles, and food -- were based on a sample of the commodities produced by these branches weighted by their respective prices.

Construction of the index for the metal processing industry presented a special problem. The metal processing industry is divided into the machine building,

the metal products, and the repair subbranches, but the commodities for which output data are available were all produced by the machine building subbranch. These commodities cannot be considered typical of the metal processing industry as a whole, because machine building grew half again as fast as metal products and repair during the First Five Year Plan.

For the years 1952-1957 the index for the metal processing industry was constructed in two steps. First, an index for the machine building subbranch was calculated from the physical output data, and, second, this index was adjusted for coverage on the basis of the reported gross value data for the machine building subbranch and for the metal processing industry as a whole. For the years 1949-1951 and 1958-59 this procedure could not be used, because the sample of physical output data was restricted to a small number of products that grew much faster than was typical of the machine building subbranch as a whole. For the years 1949-1951 the index was computed by adjusting the official data to allow for the difference in the rates of growth showing during the First Five Year Plan by the official index of gross value and the estimated index of value added. For the years 1958-1959 it was assumed that production increased at one-half of the officially claimed rate of growth, because the upward bias in the official data on the gross value of industrial production increased markedly during the "leap forward".

In the second stage of aggregation an index for industry as a whole was obtained by combining the indexes for the individual branches. The weights employed for the aggregation of the branch indexes were estimates of the values added in 1956 that were computed from wage bill paid to workers employed in industry. The wage bill was computed from data on average earnings and average employment. If data on the wage bill had been available in sufficient detail, the value added per unit of output could have been used directly as the weight for each commodity, but these data were available only for branches of industry, not for individual commodities.

2. Handicrafts

The index of handicraft production was constructed from Chinese data on the physical output of 8 commodities. For the years 1949-1957 these data were weighted by their respective prices. The years 1958 and 1959 presented a special problem because the output data for coal and pig iron include the output produced by mass campaigns and are not comparable to the output data for the earlier years. For these years the index was constructed in two steps. First, an index was constructed based on the six commodities for which output data comparable to that for the earlier years are available; and second, this index was adjusted to allow for the difference between its rate of growth and that shown by the full index of handicraft production described above.

Table 7

Derivation of the Value-Added Weights for Industry and Handicrafts

	Industry	Handicrafts	Total
Value-added in 1955			
Million 1952 yuan a/	15,266	3,170	
Index (1956=100) b/	78.81	91.22	
Value-added in 1956			
Million 1952 yuan c/	19,371	3,475	22,846
Weights (percent)	84.79	15.21	100.00

a. Derived from data on the net value of total industrial production presented in Li Hui-hung, Sung Chi-jen, and Wang Hua-hsien, "Our Views on the Classification of Light and Heavy Industry," Tung-chi kung-tso (Statistical Work), No. 18, 1957, p. 15.

b. Table 6.

c. Value-added in 1955 divided by the index numbers.

3. Total Industrial Production

In the third stage of aggregation the index of total industrial production was obtained by combining the indexes for industry and handicrafts. An independent estimate of the values added in industry and handicrafts could not be used as weights because the data on the earnings of handicraft workers necessary to calculate the weights were not available and could not be estimated. A separate estimate of the values added by industry and handicrafts is presented in Table 7. This estimate is based on an adjustment of Chinese Communist data for the net value of total industrial production in 1955.

B. For the Years 1960-1965

The index of total industrial production for the years 1960-1965 is presented in Table 8.

The system of weights used to calculate the index for the years 1949-1959 was not used for the years 1960-1965 because handicraft production could not be separated from the production of industrial enterprises and because the number of physical output series for which estimates are available was greatly reduced. For example, no complete output series is available for the metal processing industry and only a single series is available for such important branches of industry as textiles and food. The procedure used was to weight the 10 series for which estimates of physical output are available by their respective prices, and then to adjust the resulting index for the difference between its rate of growth and that shown by the index of total industrial production for the years 1953-1957. The details of this adjustment are shown in Table 8.

Table 8

Derivation of the Index of Industrial Production in Communist China, 1960-1965

1956=100

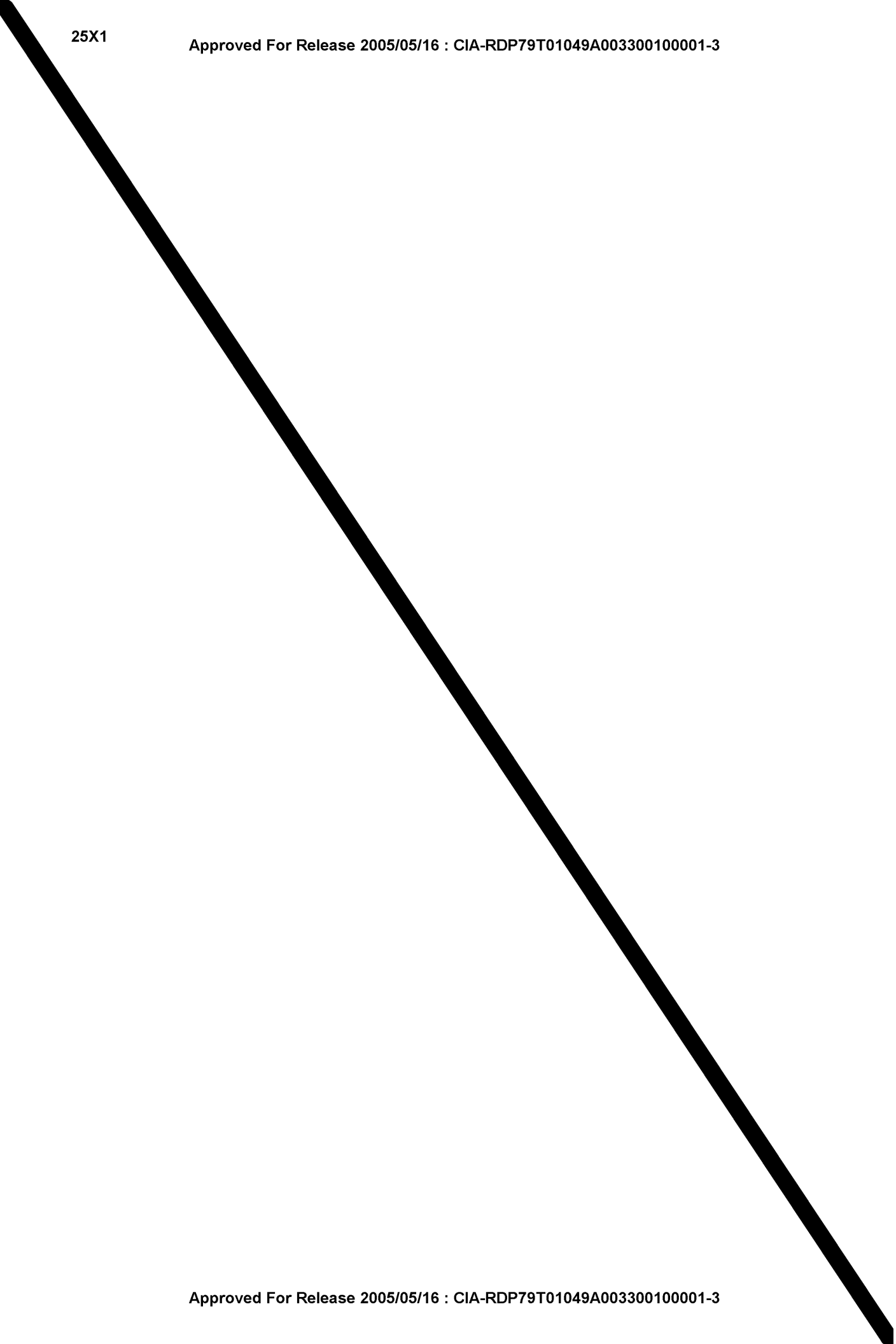
Year	Sample Output Data a/	Total Industrial Production b/
1959	197.34	181.60
1960	207.62	188.55
1961	138.94	124.52
1962	123.96	109.64
1963	138.25	120.67
1964	156.62	134.91
1965	173.65	147.63

a. Derived from the estimates of physical output presented in Appendix B.

b. Calculated from the formula:

$$I_i = \frac{1+\alpha}{1+\beta} \times \frac{I'_i}{I'_{i-1}} \times I_{i-1}$$

where I represents the index of total industrial production, I' represents the index computed from the sample output data, and α and β represent the average annual rates of growth during the years 1953-1957 of the index of total industrial production and of the sample index, respectively. The value of the index of total industrial production in 1959 is from Table 6, and the values of α and β are 0.1430 and 0.1582, respectively. (For a more complete description of this formula, see Norman M. Kaplan, and Richard H. Moorsteen, Indexes of Soviet Industrial Output, Santa Monica, 1960, pp. 61-68.)



complete statistical coverage, but at first it was effective only in those state and joint state-private enterprises that were operated by the ministries of the central government. The reporting system, however, was expanded gradually and included [redacted] all industrial enterprises by the end of 1956.

The first annual communiqué of the State Statistical Bureau was issued in 1953. The data presented on the production of industrial commodities were for the state and joint state-private enterprises only and were given in the form of index numbers or percentage increases rather than as absolute numbers. Indexes for the years 1949-1952 were presented for 15 commodities and percentage increases in 1952 for an additional 15 commodities. In 1954, a communiqué was issued for 1953 and the communiqué for 1952 was revised, but no absolute data on the production of industrial commodities were included.

The year 1955 emerges as a turning point in the quantity and quality of statistical data produced. The 1954 communiqué of the State Statistical Bureau (published in 1955) still presented production claims in the form of percentage increases, but a short statistical abstract was published for the first time. This abstract contained absolute data on the production of 14 industrial commodities for the pre-Communist peak year, for 1949, and for 1952-1954. And finally, the First Five Year Plan for Development of the National Economy of the People's Republic of China was published in August 1955. The plan contained data on the production of 46 industrial commodities,

the largest number to be included in any single source. These data were on production in 1952 and targets for 1957. Annual communiqués and statistical abstracts for 1955 and 1956 were also published in 1956 and 1957, respectively.

In the period of the "leap forward" (1958-1960), reliable statistics continued to be published for the years through 1957. The two most reliable sources of information on industrial production in Communist China were both published during this period. They are:

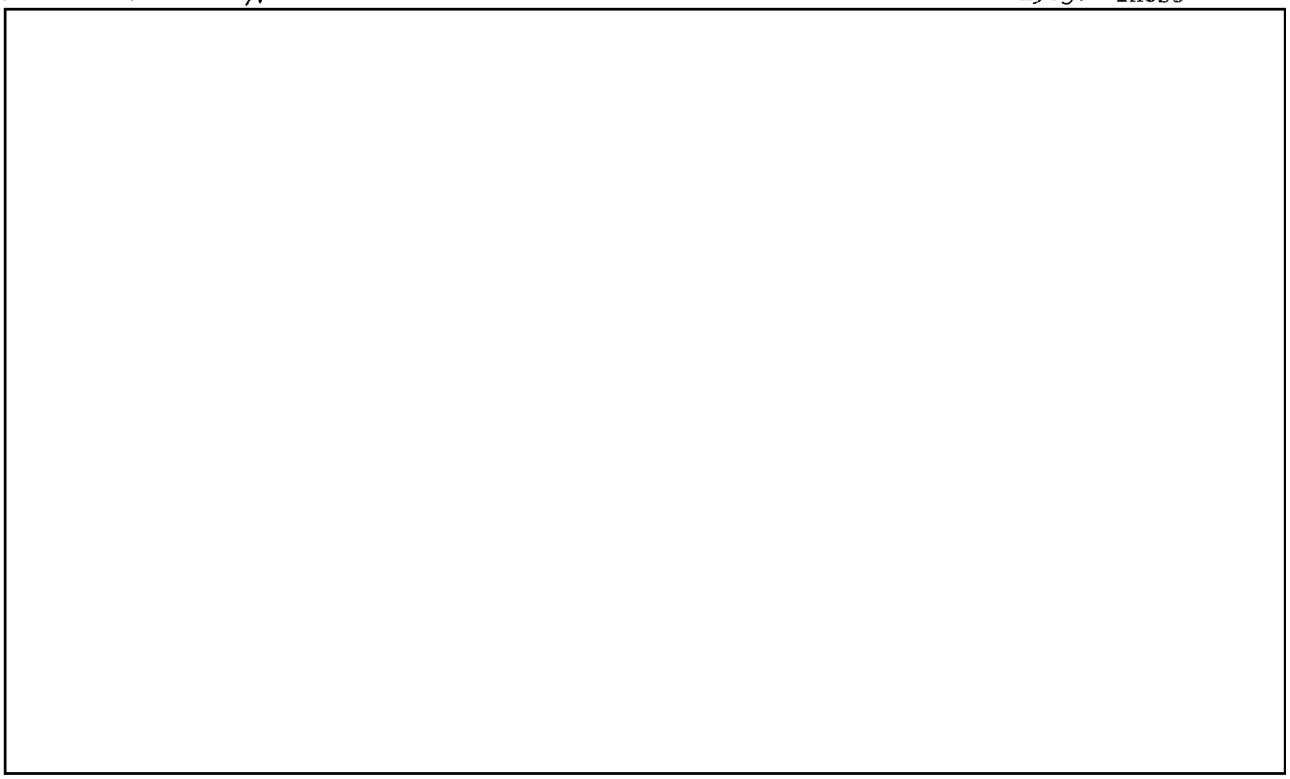
> State Statistical Bureau, Industrial Statistics Section, Wo-kuo kang-t'ieh tien-li mei-t'an chi-hsieh fang-chih tsao-chih kung-yeh ti chih-hsi (Chinese Iron and Steel, Electric Power, Coal, Machinery, Textile, and Paper Industries -- Past and Present), Peiping, 1958; and
>
> State Statistical Bureau, Wei-ta ti shih-nien (The Ten Great Years), Peiping, 1959.

The data released for the years 1958-1960, however, are not of the same quality as those released for the earlier years, and after 1958 the number of commodities for which data are available decreased rapidly. Targets and claims were doubled and redoubled, and the data for this period had to be discounted heavily in important cases.

Since the 2nd Session of the 2nd National People's Congress met in April 1960, no significant body of statistical data has been published. The regime admitted in December 1960 that major light industrial commodities which depend on agriculture for raw materials, such as cotton textiles, vegetable oils, sugar, and cigarettes, would

fall short of their targets for the year, but claimed that targets for heavy industrial commodities would be overfulfilled, and that industrial production on the whole had continued its leap forward. Actual data, however, were not released.

In the period of recovery and readjustment (1961-1965), data on industrial production were extremely scarce. The single most important source of information during this period was Chou En-lai's speech to the 1st Session of the 3rd National People's Congress on December 21-22, 1964. In this speech, Chou claimed that the output of 8 major industrial commodities — steel, petroleum, chemical fertilizers, cement, motor vehicles, cotton yarn, sugar, and cigarettes — all increased by at least 20 percent over the level of 1963. These



by the Chinese Communist regime. The estimates for individual industrial commodities vary considerably, but they all present a picture of collapse followed by gradual recovery.

The Soviet Union has also started to publish its estimates of the output of industrial commodities in Communist China. Since the Sino-Soviet dispute, Soviet authors no longer have the benefit of special access to Chinese sources, but their estimates are useful because they are derived independently. The Soviet estimates show the same pattern of collapse and recovery shown by the estimates of Western scholars. Both the Soviet and the Western estimates are reproduced in Appendix C.

No volume on the Third Five Year Plan (1966-1970) had been published as of October 1966. No base figures for 1965 or targets for 1970 have been released, and there have not even been references to the percentage increases planned for the five year period. On October 1, 1966, however, it was claimed that industrial production in the first eight months of 1966 increased by 20 percent over the corresponding period of last year and that the increase in the output of various industrial commodities ranged from 40 to 200 percent. These claims, in some ways reminiscent of those made during the "leap forward", appear to be unreasonably high, but cannot be evaluated until a larger body of data has been collected.

Appendix C

Alternative Estimates of Physical Output

1957-1965

Table 9

Alternative Estimates of Physical Output
1957-1965

	1957	1958	1959	1960	1961	1962	1963	1964	1965
lectric power (million kwh)									
Ashton a/	19,340	27,500	41,500	47,000	31,000	30,000	33,000	36,000	40,000
Current Scene b/	19,300	27,500		47,000		30,000	31,000	32,000	
Department of State c/	-								40,000
Soviet Encyclopedia e/	19,340		41,500					55,000	
Soviet Handbook f/							37,500		
Author's estimate	19,340	27,530	41,500	47,000	31,000	30,000	33,000	36,000	40,000
al (thousand mt)									
Current Scene b/	130,000	270,000		425,000		190,000-200,000	210,000	220,000	
Department of State c/									230,000
Soviet Encyclopedia e/	130,000		347,800					209,000	
Soviet Handbook f/							265,000		
Wang g/			347,800	420,000	250,000	250,000	270,000	290,000	
Author's estimate	130,730	226,400	292,400	325,000	180,000	180,000	190,000	200,000	210,000
ude oil (thousand mt)									
Current Scene b/	1,460	2,260		4,500		5,300	5,900	6,000-7,000	
Department of State c/									8,000
Soviet Encyclopedia e/	1,450		3,700					8,400	
Soviet Handbook f/							6,500		
Wang g/			3,700	5,500	6,200	6,800	7,500	8,500	
Author's estimate	1,460	2,260	3,700	4,500	4,500	5,300	5,900	7,000	8,000
ude steel (thousand mt)									
American Iron and Steel Institute h/			13,350	18,450	12,000	7,300	7,500		
Current Scene b/	5,350	8,000		18,450		7,000-8,000	7,000-9,000	8,000-10,000	
Department of State c/									11,000
Fedorov d/									10,000
Soviet Encyclopedia e/	5,350		13,350					9,500	
Soviet Handbook f/							9,500		
Wang g/			13,350	18,450	9,500	10,000	12,000	14,000	
Author's estimate	5,350	8,000	10,990	15,220	12,000	8,000	9,000	10,000	11,000

Table 9 (Continued)

	1957	1958	1959	1960	1961	1962	1963	1964	1965
Chemical fertilizer (thousand mt)									
Current Scene b/	800	1,240		2,480		2,120	2,800-3,000	3,400-3,600	
Liu i/	871	1,462	1,777	2,000	1,447	2,170	2,916		
Wu, et.al. j/	764	984	1,333	1,675	1,431	2,050	2,600		
Author's estimate	803	1,354	2,000	2,480	1,450	2,120	3,000	3,600	4,600
Cement (thousand mt)									
Current Scene b/	6,860	9,300		13,500		6,000	7,000	8,000	
Soviet Encyclopedia e/	6,860		12,300					11,500	
Soviet Handbook f/							7,500		
Wang g/			12,270	13,500	8,000	8,000	10,000	10,500	
Author's estimate	6,860	9,300	12,270	13,500	6,000	6,000	7,000	8,000	9,000
Timber (thousand cubic m.)									
Food and Agricultural Organization k/							32,000	34,000	
Richardson l/	28,000	35,000	40,000	39,000	34,000	29,000			
Author's estimate	27,870	35,000	41,200	33,000	27,000	29,000	32,000	34,000	36,000
Paper (thousand mt)									
Food and Agricultural Organization k/			2,130	2,800	2,600	2,700	2,850		
Author's estimate	1,221	1,630	2,130	2,130	1,000	1,000	1,100	1,500	1,500
Cotton cloth (million linear m.)									
Current Scene b/	5,000	5,700		7,600		3,000-3,300	3,300-3,600	4,000-4,500	
Author's estimate	5,050	5,700	7,500	6,000	3,000	3,000	3,300	3,600	3,900
Sugar (thousand mt)									
Current Scene b/							740	1,050	
International Sugar Council m/			1,260	1,260	1,200	1,300	1,300	1,840	
Author's estimate	864	900	1,130	920	700	480	540	1,100	1,500

Table 9 (Continued)

a. John Ashton, "Development of Electric Energy Resources in Communist China," 1966. Paper contributed to the Joint Economic Committee.

b. "Decision for an 'Upsurge'," editor, Current Scene, Vol. III, No. 17, April 15, 1965.

c. U.S. Department of State, Indicators of Comparative East-West Economic Strength, 1965, October 11, 1966.

d. F. Fedorov, "The Chinese People's National Holiday," Izvestiya (News), October 2, 1966.

e. USSR, Yezhegodnik bol'shoy sovetskoy entsiklopedii: 1965 (1965 Yearbook of the Great Soviet Encyclopedia), Moscow, 1965, p. 283.

f. USSR, Academy of Sciences, Institute of World Economics and International Relations, Mirovaya ekonomika; kratiy spravochnik (World Economy; A Short Handbook), 2nd edition, Moscow, 1965, pp. 28-29.

g. K.P. Wang, "The Mineral Industry of Mainland China," Minerals Yearbook, US Bureau of the Mines, 1963 and 1964.

h. American Iron and Steel Institute, Foreign Trade Trends; Iron and Steel, New York, 1964.

i. Jung-chao Liu, "Fertilizer Application in Communist China," The China Quarterly, October-December 1965.

j. Yuan-li Wu, Francis P. Hoeber, and Mabel M. Rockwell, The Economic Potential of Communist China, Vol. 3, 1964, p. 34.

k. UN, Food and Agriculture Organization, Yearbook of Forest Products Statistics, 1961, 1962, 1963, 1964, and 1965.

l. S.D. Richardson, Forestry in Communist China, Baltimore, 1966, p. 166.

m. International Sugar Council, Statistical Bulletin, July 1965.

Table 9 (Continued)

a. John Ashton, "Development of Electric Energy Resources in Communist China," 1966. Paper contributed to the Joint Economic Committee.

b. "Decision for an 'Upsurge'," editor, Current Scene, Vol. III, No. 17, April 15, 1965.

c. U.S. Department of State, Indicators of Comparative East-West Economic Strength, 1965, October 11, 1966.

d. F. Fedorov, "The Chinese People's National Holiday," Izvestiya (News), October 2, 1966.

e. USSR, Yezhegodnik bol'shoy sovetskoy entsiklopedii: 1965 (1965 Yearbook of the Great Soviet Encyclopedia), Moscow, 1965, p. 283.

f. USSR, Academy of Sciences, Institute of World Economics and International Relations, Mirovaya ekonomika; kratiy spravochnik (World Economy; A Short Handbook), 2nd edition, Moscow, 1965, pp. 28-29.

g. K.P. Wang, "The Mineral Industry of Mainland China," Minerals Yearbook, US Bureau of the Mines, 1963 and 1964.

h. American Iron and Steel Institute, Foreign Trade Trends; Iron and Steel, New York, 1964.

i. Jung-chao Liu, "Fertilizer Application in Communist China," The China Quarterly, October-December 1965.

j. Yuan-li Wu, Francis P. Hoeber, and Mabel M. Rockwell, The Economic Potential of Communist China, Vol. 3, 1964, p. 34.

k. UN, Food and Agriculture Organization, Yearbook of Forest Products Statistics, 1961, 1962, 1963, 1964, and 1965.

l. S.D. Richardson, Forestry in Communist China, Baltimore, 1966, p. 166.

m. International Sugar Council, Statistical Bulletin, July 1965.

Appendix D

Indexes of Industrial Production for Selected Countries, Prewar, and 1949-1965

Table 10

Indexes of Industrial Production for Selected Countries, Prewar, and 1949-1965

1956=100

	Soviet Union a/	Japan b/	Communist China c/	India d/
Prewar e/	36.1	64.6	37.1	58
1949	46.8	32.5	27.2	67
1950	53.6	39.4	34.3	66
1951	61.3	53.8	45.6	74
1952	67.1	57.7	56.1	76
1953	73.8	69.7	70.2	78
1954	82.1	75.5	80.2	83
1955	91.3	81.7	80.7	92
1956	100.0	100.0	100.0	100
1957	109.1	116.3	109.4	104
1958	119.8	114.7	143.8	107
1959	132.0	137.5	181.6	117
1960	142.2	171.2	188.5	130
1961	153.5	204.3	124.5	139
1962	166.0	221.1	109.6	150
1963	177.5	243.3	120.7	164
1964	189.6	284.6	134.9	175
1965	203.3	298.1	147.6	184

STATINTL

a. [redacted] "Soviet Industry Trends in Output, Inputs, and Productivity," Joint Economic Committee of the U.S. Congress, New Directions in the Soviet Economy, Washington, 1966, p. 280, except for the prewar year. The index selected is the aggregate industrial production with the growth in the gross value of output of machine building and metal working discounted by 20 percent. For the prewar year, [redacted] index was linked with the index in Norman M. Kaplan and Richard H. Moorsteen, Indexes of Soviet Industrial Output, Santa Monica, 1960, p. 235.

b. The Bank of Japan, Economic Statistics of Japan, 1964, Tokyo, 1965; and Office of the Prime Minister, Bureau of Statistics, Monthly Statistics of Japan, August, 1966.

c. Appendix A, except for the prewar year. For the prewar year, I linked my index with the index in Liu Ta-chung and Yeh Kung-chia, The Economy of the Chinese Mainland: National Income and Economic Development, 1933-1959, Princeton, 1965, p. 66.

d. United Nations, 1953 Statistical Yearbook; India, Ministry of Finance, India: Pocket Book of Economic Information, Delhi, 1964 and 1965; Indian Institute of Public Opinion, Monthly Commentary on Indian Economic Conditions, September 1966, p. 22.

e. The year is 1937, except for Communist China. The year for China is 1933.

STATINTL

Notes and Sources

1. First Five Year Plan for Development of the National Economy of the People's Republic of China, Peiping, 1956, p. 13.

2. State Statistical Bureau, "Communiqué on Fulfillment and Overfulfillment of China's First Five Year Plan," New China News Agency, April 13, 1959; in American Consulate General, Hong Kong, Current Background, No. 556, April 15, 1959, p. 3.

3. Derived by subtracting the number of projects reported for the years 1953-1957 in Ibid. from the number reported for the years 1953-1958 in State Statistical Bureau, Ten Great Years, Peiping, 1960, p. 67.

4. "Rapid Growth of China's Chemical Industry," Jen-min jih-pao (People's Daily), September 25, 1964.

5. Chao Kang, The Rate and Pattern of Industrial Growth in Communist China, Ann Arbor, 1965.

6. Liu Ta-ching and Yeh Kung-chia, The Economic Development of the Chinese Mainland: National Income and Economic Development, 1933-1959, Princeton, 1965.

7. "Daily-use commodities" does not appear to be an officially designated branch of industry, because it is not listed in any published version of the Chinese Communist industrial classification system. When the Chinese discuss consumer goods, however, they frequently divide them into commodities to eat, commodities to wear, and commodities to use, and this last category is referred to as jih-yung-p'ing (commodities for daily use). But each of the 11 groups included in this category by Chao I-wen in Hsin chung-kuo ti kung-yeh (The Industry of New China), Peiping, 1957, corresponds to a branch or subbranch listed in the 1956 Abridged Classification of Industrial Branches (see State Statistical Bureau, Kung-yeh t'ung-chi-hsüeh chiang-i /Lectures on the Study of Industrial Statistics/, Peiping, 1958, pp. 32-35). This identification of the groups means that "commodities for daily use" is not a separate branch of industry, but merely a convenient way to refer to those consumer goods that are neither eaten nor worn.

8. First Five Year Plan for Development of the National Economy of the People's Republic of China, Peiping, 1956, p. 49.

9. Chao cites Li Choh-ming, Economic Development of Communist China, Berkeley, 1959, p. 44, but a Chinese source indicates that the figures refer only to state-operated enterprises. See State Statistical Bureau, "Kuo-min ching-chi t'ung-chi t'i-yao" ("Statistical Abstract of the National Economy"), appended to the pamphlet Kuan-yü 1956 nien-tu kuo-min ching-chi chi-hua chih-hsing chieh-kuo ti kung-pao (Communique on Results of Implementation of the 1956 Economic Plan), released August 1, 1957, Peiping, no publication date, pp. 32-33.

10. Chao cites Chao I-wen, Hsin ching-kuo ti kung-yeh (New China's Industry), Peiping, 1957, p. 52, but the figure originally appeared in the First Five Year Plan.

11. Jen-min jih-pao (People's Daily), August 9, 1966.

12. Jen-min jih-pao (People's Daily), August 14, 1966.

13. On October 17, 1966, for example, Tass reported that the output of cotton cloth at the Number 1 Textile Mill in Peiping had dropped by 360,000 meters a month because of activities undertaken in connection with the cultural revolution. The loss was attributed specifically to absenteeism by members of the Red Guard, who constituted over one-third of the workers at the mill.

14. Jen-min jih-pao (People's Daily), June 8, 1966.

15. New China News Agency, International Broadcast, September 30, 1966.

16. For estimates of the physical output of these commodities, see Appendix C.